Item No.	Reference	Comments by EPA Dated July 18, 2014	PRP Response Dated: August 28, 2014
1.	Revised CSM General	by the Superfund program: http://www.epa.gov/oswer/riskassessment/pdf/superfund-hh-exposure/OSWER-Directive-9200-1-120-ExposureFactors.pdf These Standard Default Exposure Parameters are used in the Regional Screening Level (RSL) calculator. http://www.epa.gov/region6/6pd/rcra_c/pd-n/screen.htm The RSL calculator shows, as of May 2014, the updated non-cancer screening level for 2,3,7,8-TCDD toxicity equivalent quotient (TEQ) for an industrial worker is 730 part per trillion.	McKesson acknowledges these recent changes in the RSL calculator showing a slightly higher compliance value of 730 ppt TEQ for industrial site PCDD/Fs.
2.	Revised CSM Table 1 ROD p. 64-65	(ppt). The Record of Decision (ROD) originally set the dioxin clean-up level at 20,000 ppt, and it required 6-12 inches of clean soil as a cover. Data in Table 1 of the Revised CSM indicate there are many areas where dioxin concentrations in soil under the cover exceed the new screening level of 730 ppt. However, EPA understands that many of the additional samples identified in the Revised CSM are to be collected from the cover soil, not from the native soil below it. Therefore, concerns about the level of heterogeneity in the soil to be tested may or may not be applicable at this point, but they are presented below for informational purposes.	McKesson acknowledges that native soils beneath the cap may exceed 730 ppt TEQ. The clean soil cap and vegetative cover approved as the ROD remedy for the Arkwood Inc. Site remains in place as an effective barrier to prevent contact with such soils. Deed restrictions are in place to prevent future uses that would disturb the integrity of the ROD remedy. Thus, heterogeneity of soil PCDD/F concentrations beneath the vegetated cap are not relevant to determining compliance of the Site with the updated dioxin screening level.
3.	Revised CSM page 1 ICS User Guide Page 29	The CSM states that "the USEPA (2011) guidance for incremental composite soil sampling was utilized" However, some proposed actions do not follow the guidance. One of these is the approach for determining compliance with the TEQ screening level.	The USEPA (2011) guidance provides useful sampling approaches for statistically-based sampling to manage uncertainties for sites not previously investigated, remediated and capped. Such uncertainties for the Arkwood Inc. Site are

_			Comments on Revisea Conceptual Site is	
		Item 11		much more limited than the 2011 guidance assumes
			The CSM uses the term decision unit (DU) presumably using	because the extensive remediation completed under
			the term as the ICS User Guide does. The definition of DU	EPA oversight creates reasonable expectations for
			according to the ICS guidance is "the volume of soil over	homogeneous soil concentrations when applying
				the ICS approach to this Site. Initial discrete
			to a regulatory threshold value." [emphasis added] Yet the	sampling of local sinks (ditches) revealed
			proposed plan says that "the maximum composite	consistent trends around half of the 730 ppt RSL
			measurement for each DU [will be compared] to the dioxin	for all but one sample. Compliance with the 730
			soil screening level of 665 ppt TEQ." (Note that the screening	ppt RSL does not require proof that the 95% UCL
			level has now changed to 730 ppt. See comment No. 1.) This	is below that value for the validation data collected
			proposed approach conflicts with the ICS guidance.	regarding this remediated Site. Based on these
				findings and the Site remediation history,
			The ICS User Guide relies on statistical calculations to	McKesson believes the proposed IC sampling
			determine an estimate of the average concentration for a	approach will demonstrate that none of the samples
			decision unit (DU). By using the 95% upper confidence	exceed the RSL and hence the Site is demonstrably
			interval (UCL) as the statistical estimate of the DU mean, the	in compliance.
			likelihood of making a decision error about whether or not the	
			true DU average exceeds the screening level is controlled to	
			5% or less.	
	4.	Revised CSM	Generating a UCL for the average DU concentration requires	McKesson has agreed to increase the number of
		General	· · · · · · · · · · · · · · · · · · ·	SUs as suggested by EPA such that the total data
			for doing this. In this comment EPA presents 2 that are	set is reasonably robust ($n = 26$ IC samples,
			relevant here.	including 3 SUs with 3 replicates each in the
				DU#2, DU#5 and DU#6) for validating compliance
			1) When an incremental sample covers an entire DU, the	with the 730 ppt RSL, as described below.
			estimate of variability is usually obtained by collecting at	McKesson acknowledges that the 2011 guidance
			least 3 independent replicate DU-ICS samples (i.e., 3	describes these statistical approaches for evaluating
			separate ICS samples, each having 30 or more increments,	UCL concentrations for use in risk assessment.
			and each of which evenly covers the entire DU area).	However, the considerations listed above in
				response to items #2 and #3 reasonably support
			DU, this provides 3 independent estimates of the DU	expectations that: (1) representative IC soil samples
			mean.	(including maximum values for all SUs) upon
		l	mean.	(merading maximum varues for an 503) upon
			a. If the 3 DU-ICS replicate samples agree within 20%	proposed further investigation will reveal surface
			a. If the 3 DU-ICS replicate samples agree within 20% RSD, the 3 DU-ICS values can be used to calculate a	proposed further investigation will reveal surface soil concentrations uniformly below the 730 ppt
			a. If the 3 DU-ICS replicate samples agree within 20% RSD, the 3 DU-ICS values can be used to calculate a Student's-t UCL.	proposed further investigation will reveal surface

exceeds 20% RSD, a Chebyshev UCL should be	
calculated. If the Chebyshev UCL exceeds the	
decision threshold,	
: The ICC mentionation OC/meniobility montistion	:.

- i. The ICS replication QC/variability partitioning results should be evaluated to identify effective corrective actions to the sampling design, or ii. The decision may be that the DU is assumed to exceed the threshold.
- 2) If the DU is divided into subunits (which are called sampling units (SUs), which is what this CSM proposes, the variability between the SU results can be used in the calculation of the DU's UCL. Note that a few things are different from scenario 1 above.
 - a. SU-ICS samples are NOT replicates because they do not cover the same soil volume.
 - b. Individual SU-ICS sample are not representative of the entire DU because they do not cover the entire DU.
 - c. Either all of the SUs comprising a DU must be sampled, or, if there are enough SUs in a large DU, a statistically valid subset of the SUs can be sampled. Since SUs cover different portions of the DU, a normal distribution of SU-IS results cannot be expected. Therefore, the following guidelines are suggested to avoid the time and expense of follow-up sampling events to address data uncertainties:
 - i. If the SUs to be sampled are selected randomly, enough SU-IS results must be available to determine the distribution of SU-IS results (so that the correct type of parametric or nonparametric UCL can be selected).
 - 1. If the average <u>DU concentration is</u> expected to be near the action level/decision threshold...
 - a. ... and the DU is expected to be <u>fairly</u>

the RSL if none of the IC samples exceed 730 ppt TEQ.

Comments on Revised Conceptual Site N	logei
<u>homogeneous</u> within its borders (i.e.,	
SUs will probably have similar	
results), no less than 7 SU-IS results	
are needed.	
band the DU is expected to be	
heterogeneous within its borders (i.e.,	
SUs will probably have very different	
results), no fewer than 10 SU-IS	
results are needed.	
c. If the number of SUs in the DU is	
fewer than these limits, then all SUs	
should be sampled.	
2. If the average <u>DU concentration is</u>	
expected to be far above or below the	
action level/decision threshold	
aand the DU is expected to be <u>fairly</u>	
homogeneous within its borders (i.e.,	
SUs will probably have similar	
results), no less than 5 SU-IS results	
are needed.	
band the DU is expected to be	
heterogeneous within its borders (i.e.,	
SUs will probably have very	
different results), no fewer than 7	
SU-IS results are needed.	
c. If the number of SUs in the DU is	
fewer than these limits, then all SUs	
should be sampled.	
ii. If the number of SU-ISs actually collected is	
less than these guidelines, the nonparametric	
Chebyshev UCL must be used since there is	
likely insufficient data for reliable results from	
parametric distribution tests.	
1. If the Chebyshev UCL exceeds the	
decision threshold:	
a. Either the DU must be considered to	

Comments on Revised Conceptual Site N	lodel
exceed the threshold, or	
b. Additional SU-ISs can sampled to add	
to the data set so that the UCL might	
be calculated as less than the	
threshold.	
2. If the Chebyshev UCL does not exceed the	
decision threshold:	
a. Evaluate the actual between-SU	
variability for this DU AND in	
neighboring or similar DUs for	
indications that the sampling design	
was inadequate to capture the full	
range of variability.	
b. Determine the highest between-SU	
standard deviation (SD) among all	
similar DUs. Use this SD to	
recalculate Chebyshev UCLs for the	
DU.	
i. If the Chebyshev UCL exceeds the	
decision threshold, follow Line #1	
directly above.	
ii. If the Chebyshev UCL calculated	
with the worst case SD does not exceed	
the decision threshold, no additional	
sampling is needed.	
d. Because the SU-ICS samples do not represent	
estimates of the DU mean, the variability between	
SU-ICSs can be expected to be higher than the	
variability between DU-ICSs, which will increase	
the distance between the calculated mean and the	
UCL.	
e. Again, because the SU-ICS samples are not estimates	
of the DU mean, the t-UCL cannot be used unless there	
are enough SU-ICSs to establish that the distribution of	
SU-ICS results is normally distributed. Therefore, a 95%	

{00058234.DOCX-1}

Chebyshev (nonparametric) UCL must be used.

	T	Comments on Revised Conceptual Site is	viouci
		Chebyshev UCLs are higher than corresponding t-UCLs. f. At least 3 SU-ICSs are needed to calculate a reliable UCL for the DU. g. UCL calculations can be performed, or explored, using the Excel "ICS-95UCL calculator" which is programmed with the following UCL equations.	
		Student's- t $UCL = \bar{x} + t_{1-\alpha,r-1} \times \frac{SD}{\sqrt{n}}$ Chebyshev $UCL = \bar{x} + \left(\sqrt{\frac{1}{\alpha}} - 1\right) \frac{SD}{\sqrt{n}}$	
5.	Revised CSM page 3 paragraph 1 paragraph 2 Figure 6	Infiltration of storm water through the cap or the base of the ditches will potentially mobilize residual contamination in the sink hole. Based on current flow data, the amount of infiltration occurring between the sink hole and New Cricket Spring may be negligible, but in wetter years that may not be true. Either colloidal transport or dissolution or both may be occurring and either may be the primary mechanism for dioxin movement in groundwater at this site. New technology is available to better assess this movement and the concentration reaching offsite wells or springs, and different standards now apply. The groundwater transport pathway should be considered complete, and additional decision unit(s) should be added to assess impacts to off-site receptors.	2012 investigations between the water treatment plant and the associated retention pond are well below the 730 ppt RSL, demonstrating compliance under the dioxin reassessment that triggered this re-

		Comments on Revised Conceptual Site is	
6.	Revised CSM page 3 paragraph 1 paragraph 2	As stated above, the groundwater transport pathway should be considered complete. The off-site residential receptor should be included in the Conceptual Site Model. Please revise the text and figure.	See response to item #5 above.
	Figure 6		
7.	Revised CSM page 3 paragraph 1 paragraph 2	Corporation cannot control the off-site usage. If results of	Please see response to item #5 above and responses to agency comments on the Supplemental Groundwater Tracing Study Work Plan.
	Tiguic 0	See similar comments on Tracer Study Plan (including Tracer Study Comment No. 4, a general comment on that plan).	
8.	Revised CSM page 5 Decision Unit No. 1	The CSM states that "no treated wood storage or processing activities were conducted based on available information." However, an aerial photo from 1970 is available that shows the same activities occurring in this area as in the main area of	McKesson acknowledges that a portion of DU#1 was utilized in the past for wood storage but likely not treated wood storage based on the treating process and soil contaminant data collected from this area and assessed during the remedial investigation. Nonetheless, McKesson has agreed to sample 3 SUs within DU#1 in order to further assess and confirm these expectations.

		Comments on Revised Conceptual Site is	· iouci
		It is not clear whether this area was ever sampled at all. If it is contaminated in the ppb range (1,000 times the ppt range of the screening level), then sampling just 2 SUs will be enough to establish this.	
		If the area has concentrations in the ppt range, ProUCL or a similar statistical software package can be used to estimate concentration results that will produce a Chebyshev UCL below 730 ppt with only 2 SUs.	
9.	Revised CSM page 5 Paragraph 1 ROD p. 65	This paragraph says "All of the proposed samples will be surface soil samples collected from 0-2 inches in depth." However, the remedy described in the ROD calls for the entire site to be covered with 6 to 12 inches of clean topsoil.	McKesson will agree to perform all IC sampling site-wide using cores from 0-6 inches in depth.
		Thus, the proposed samples should be collected from a minimum of 0-6 inches in depth.	
10.	Revised CSM page 5	Under most situations, EPA would recommend no less than 8 SUs so that the statistical distribution of the SU data could be determined, and it would not be necessary to default to a	McKesson will agree to increase the sample collections to include 8 SUs randomly selected within DU#2, despite the fact that the single source
	Decision Unit No. 2	nonparametric UCL (which are higher than parametric UCLs). However, if the concentrations are as low as McKesson	
		However, it is useful to explore what could happen statistically with different types of data sets. Doing this can help refine a sampling design so that the chance of needing to come back and collect more samples can be balanced against	samples will be well below the 730 ppt RSL. Further, it is expected that the storm water ditch samples adjacent to DU#2, representing the 4 IC samples included for DU#3 and DU#4, will
		the cost/benefit of collecting more samples in the first go. DU#2	similarly demonstrate compliance with the RSL and add robustness to the conclusion that this large capped area is in compliance regarding PCDD/Fs in surface soils. If all representative IC samples are

For example, as an	DU ID:	Exploration	consistently well below the 730 ppt RSL, the DU
upper bound on		-	must be considered to be in compliance even if the
potential data	Data pt 1	580.0	appropriate estimate of the 95% UCL is greater
outcomes, data	Data pt 2	550.0	than the maximum concentration of the 10 IC
exploration shows	_		samples.
that for an $n = 5$, a	Data pt 3	600.0	
mean = 615.6 , and a	Data pt 4	698.0	
SD = 58.7, the 95%			
Chebyshev UCL =	Data pt 5	650.0	
730.0 ppt.	Data pt 6		
Using statistics to	Data pt 7		
estimate the DU mean			
for comparison to the	Data pt 8		
screening level of 730	Data pt 9		
ppt has the following			
2 ramifications:	Data pt 10		
• Even if all of the sample	SU-ICS Mean =	615.6	
concentrations are less than	Total Std Dev =	58.7	
730 ppt, but	n =	5	
the variability in the data set	1-sided 95%t-UCL =	671.6	
is such that the	RSD (as %) =	9.5	
UCL exceeds 730 ppt, the	Chebyshev 95UCL =	730.0	
decision is that, a average may exc then 2 options proceed accordin	t 95% decision confider eed the screening level. : assume the DU is "dir gly, or collect additional UCL under the screening	There are ty" and Il data that	
EXCEED the UCL is LESS decision is tha	ore SU-ICS sample con 730 ppt screening level than the screening level to there is 95% confidences NOT exceed the screen	, if the 95% l, the ce that the	

calculator	illustrates:			
	DU#2	DU#2	DU#2	
\mathbf{DU} 1	ID: Explora	ition Explora	tion	
	E	Exploration		
Data pt 1	725.0	40.0	450.0	
Data pt 2	725.0	40.0	475.0	
Data pt 3	725.0	40.0	500.0	
Data pt 4	725.0	40.0	525.0	
Data pt 5	735.0	735.0	550.0	
Data pt 6			575.0	
Data pt 7			600.0	
Data pt 8			625.0	
Data pt 9			650.0	
Data pt 10			735.0	
Mean = Total Std Dev	727.0	179.0	568.5	
=	4.5	310.8	87.1	

5

731.3

735.7

n = 1-sided 95%t-UCL =

Chebyshev 95UCL =

RSD (as %) = 0.6

However, this is not easy to achieve with 5 samples as the following snapshot from the UCL

Each of the data columns has 1 value that slightly exceeds 730 (red frame). The first data column (the farthest left) minimizes variability by having all results close together (but 4 of them below 730), but the concentration will always be over 730 (blue frame). The second data column shows how the Chebyshev UCL will exceed 730 even if all other results are very low such that the mean is very low. The UCL is high due to the high variability created by a single high result.

{00058234.DOCX-1 }

5

475.3

173.6

784.9

10

619.0

15.3

688.6

		Comments on Revised Conceptual Site 1	
		On the other hand, when 10 SU results are available, 1 or more individual SUs could exceed the screening level without pushing the UCL over, as long as the other results were low enough and consistent enough for the mean and SD to be low. In addition, since there are 10 data points, ProUCL can be used to test the data set's distribution. Since the third data set is normally distributed, the t-UCL (green frame, 619 ppt) would be appropriate to use.	
11.	Revised CSM page 5 Decision Units No.3 and No. 4	EPA accepts the proposal for sampling of the 2 storm water ditches.	McKesson acknowledges this consideration.
12.	Revised CSM page 5 Decision Unit No. 5	heterogeneity in this area is "moderate." The 2012 data, as mentioned in the proposed plan, were 328 and 1600 ppt	McKesson agrees to increase the IC sampling in DU#5 to include 3 replicates in this very small area in order to address uncertainties regarding the 1600 ppt TEQ discrete sample reported earlier for the berm area.

		Comments on Revised Conceptual Bite is	10461
13.	Revised CSM page 6 Decision Unit	On the other hand, if the thought is that a single DU-ICS sample will exceed, and some cleanup activity will be required, then EPA could accept a single ICS result and no UCL. If the DU-ICS result exceeds 730 ppt, then the sampling design worked out. However, if the DU-ICS sample comes back less than 730 (even if it were only 50 ppt), then more work would be required, as discussed in the paragraph above, to establish that the DU mean (as estimated by a UCL) is less than 730 ppt. Because of the higher level of heterogeneity near the wash pad, the ½-acre SU for the wash pad area should have 3 DU-ICS replicates. EPA agrees that the other SU may have one 30-increment DU-ICS. The average (not a UCL) of the 3	McKesson agrees to sample the wash pad area as a replicate area (3 IC samples) and to include 2 other randomly selected SUs in DU#6 for IC sampling for a total of 5 IC samples in DU#6.
	No. 6	replicates SU and the single SU-ICS result (n = 2) would be used to calculate a UCL for the DU. The issue of a very low n, along with potentially large variability between the 2 SU results increases the chance that the UCL will exceed 730 ppt even if the calculated mean is fairly low. This could necessitate returning to the site to resample if demonstrating that the DU is "clean" is the expected goal. If the UCL exceeds 730, and it looks like only the wash pad is "dirty," and it is desirable to not clean up the rest of the DU, at least 1 more SU will need to be sampled so that there will be an n of at least 2 to calculate the new DU's (3 SUs, without the	
14.	Revised CSM page 6	wash pad) UCL.	McKesson acknowledges this consideration.
	Decision Unit No. 7		
15.	Revised CSM Figure 6		McKesson agrees to use the industrial worker terminology in the CSM.

		Comments on Revised Conceptual Site is	2000
	ROD	be limited, and the Deed Notice restricts subsurface digging or	
	Page 22, 52	disturbances. Also, the non-carcinogenic industrial soil	
		screening level is calculated based upon a standard worker	
	Corrected Deed	scenario. To be consistent with the terminology used in the	
	Notice and	ROD, please identify the industrial worker as a receptor at the	
	Restrictions Page	site. This would also address the possibility of industrial	
	3	workers at nearby affected locations. EPA acknowledges that	
		exposure to the surface soil (0 to 6 inches) is the only complete	
		exposure pathway at the site, similar to the maintenance	
		worker. Please adjust the figure to read industrial worker to	
		align with future land use and risk screening tables.	
16.	Anticipated	Regarding:	McKesson acknowledges these considerations as
	Future Use of	(1) the potential sale of 12 acres adjacent to the	also explained in response to items #5 and #7
	Adjacent	southeast end of the Arkwood site,	above.
	Property	(2) other properties nearby where dye may show up,	
		and	
		(3) the effects of such events on the revised CSM and	
		DUs,	
		it will be appropriate to evaluate such subjects following	
		completion of the supplementary groundwater dye-tracing	
		investigation. This will enable consideration of the intended	
		reuse scenario in the context of a revised CSM. If the tracer	
		study shows water flows from the site to other properties,	
		then that would indicate additional pathways exist and	
		dioxin sampling would be needed.	
18.	Anticipated	Access to the adjacent 12 acres must be kept separate from the	McKesson acknowledges this consideration.
	Future Use of	rest of the National Priorities List (NPL) site.	5
	Adjacent	,	
	Property		
L	1 "		